

(19)日本国特許庁(JP)

(12) 公開実用新案公報(U)

(11)実用新案出願公開番号

実開平6-2285

(43)公開日 平成6年(1994)1月14日

(51)Int.Cl.⁵

G 0 4 G 9/00

1/00

識別記号

3 0 8 B 9109-2F

3 0 1 Z 9109-2F

庁内整理番号

F I

技術表示箇所

審査請求 未請求 請求項の数2(全3頁)

(21)出願番号

実願平4-37836

(22)出願日

平成4年(1992)6月4日

(71)出願人 000002369

セイコーエプソン株式会社

東京都新宿区西新宿2丁目4番1号

(72)考案者 志村 典昭

長野県諏訪市大和3丁目3番5号セイコー

エプソン株式会社内

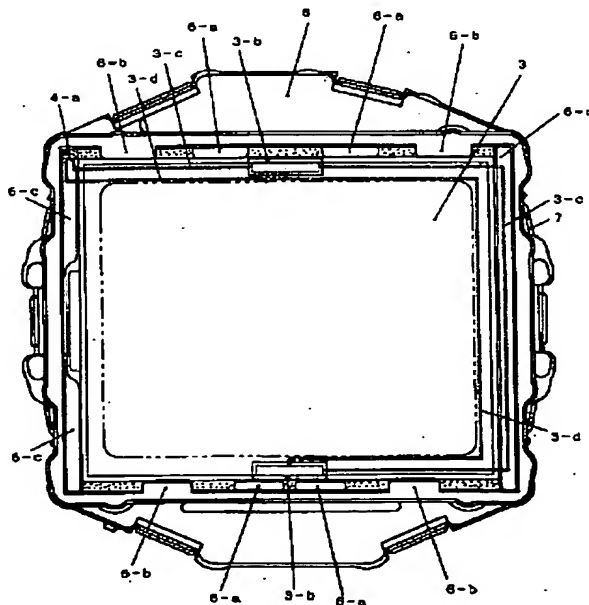
(74)代理人 弁理士 鈴木 喜三郎 (外1名)

(54)【考案の名称】 電子時計の照明構造

(57)【要約】

【目的】簡略構造により電子時計の照明機能を大幅に改善することを目的とする。

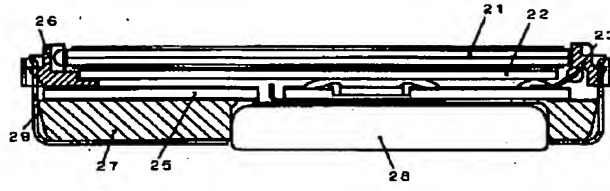
【構成】液晶表示パネル、該表示パネルに電気信号を供給する為の回路ブロック等を有する電子時計において、エレクトロルミネッセンス素子を用いた発光部と該発光部に電気信号を供給する電極を形成した透明部材を、前記液晶パネルの上面に重ねて配置し、さらに前記液晶表示パネルと前記回路ブロックの電氣的導通手段であり導電性ゴムを用いたコネクタが前記表示パネル外形から平面的にとび出して配置されるとともに、前記コネクタのとび出し部が前記透明部材上に形成された前記発光部に電気信号を供給する電極の一部と平面的かつ断面的に重なる様構成する。



(3)

実開平6-2285

【図4】



であり、表示パネルの表示部全域にわたって均一かつ十分な明るさを確保可能な電子時計の照明構造を提供するところにある。

【0007】

【課題を解決するための手段】

本考案の電子時計の照明構造は、液晶表示パネル、該表示パネルに電気信号を供給する為の回路ブロック等を有する電子時計において、エレクトロルミネッセンス素子を用いた発光部と該発光部に電気信号を供給する電極を形成した透明部材を、前記液晶パネルの上面に重ねて配置したことを特徴とする。

【0008】

さらに、前記液晶表示パネルと前記回路ブロックの電氣的導通手段であり導電性ゴムを用いたコネクタが前記表示パネル外形から平面的にとび出して配置されるとともに、前記コネクタのとび出し部が前記透明部材上に形成された前記発光部に電気信号を供給する透明電極の一部と平面的かつ断面的に重なる様構成したことを特徴とする。

【0009】

【実施例】

以下に図1、図2を用いて本考案の実施例を説明する。図1は本実施例のデジタル電子腕時計用ムーブメントの平面図、図2は同じく要部断面図である。1は上ガラス1-a、下ガラス1-b、液晶、偏光板1-d等から成る液晶表示パネル、2は反射板、4はゼブラ型コネクタ（以下コネクタと記す）、5は回路基板、6はパネル枠、7は回路押さえ板であり各々周知の働きをする。なお照明に関する構造以外は従来構造と共通であり図2においては省略する。3は透明ガラスから成る基板材3-aに発光部3-bを設けた照明板である。発光部3-bは基本的にはエレクトロルミネッセンス（以下ELと記す）発光層を透明電極でバインドした構造であり、耐湿性を向上させる為水分を通しにくい合成樹脂から成る防湿膜で前記透明電極とEL発光層を更にバインドしている。基板材3-aの液晶パネル1側の面にまず第一の防湿膜を形成し、その上に第一の透明電極3-cを形成、その上にEL発光層を形成、その上に第2の透明電極3-dを形成、最後に第2の防湿膜を形成している。なお防湿膜は図中において省略する。透明電

。【考案の効果】

以上述べたように本考案によれば従来のランプを用いた照明構造に比べ以下の効果を有する。

【0015】

- 1 発光部を液晶表示パネルの表示部に平面的、断面的に極力近く設置できる。
- 2 発光部設置位置の平面的自由度は極めて高く、設置箇所も必要に応じて複数個設置可能である。

【0016】

- 3 1、2により表示部をより明るく、さらには均一な明るさを表示部全域にわたって提供できる。

【0017】

- 4 従来の時計構造を大きく変更すること必要がなく、簡略構造で実現可能である。特に表示パネル用コネクタを兼用して回路基板との電氣的導通がとれる点ではコスト的メリットも大きい。

【0018】

この様に本考案の電子時計の照明構造によれば、暗がりでも時計の表示内容を容易に読みとることができる実用性の高い商品を市場に提供可能となる。活動時間帯の24時間化がますます進んで行くこれからの社会において本考案の果たす役割は大きく、その効果は絶大である。

(57)
[ABSTRACT]

[PURPOSE]

It is aimed at largely improving an illumination function of an electronic clock by simple structure.

[CONSTITUTION]

The transparent member which formed an electrode supplying an electrical signal in the emission of light region with the use of an electroluminescence element and the emission of light region in an electronic clock comprising circuit blocks to supply an electrical signal to a LCD panel, the display panel is repeated in the top surface of the liquid crystal panel, and it disposes, it is the, even more particularly, LCD panel and electrical conduction means of the circuit blocks, and a connector with the use of electroconductivity rubber jumps out of the display panel external form planarly, and is disposed, and it is composed so that of one part and a plane of an electrode supplying an electrical signal and a section are piled up in the emission of light region that they jump out, and a part is formed on the transparent member of the connector.

[CLAIM FOR THE UTILITY MODEL REGISTRATION]

[Claim 1]

In an electronic clock comprising circuit blocks to supply an electrical signal to a LCD panel, said display panel; Illumination structure of an electronic clock; wherein; The transparent member which formed the electrode which supplied an electrical signal in the emission of light department with the use of an electroluminescence element and said emission of light department was repeated in the top surface of above liquid crystal panel, and it disposed.

[Claim 2]

Illumination structure of an electronic clock; according to claim 1 wherein; It was said LCD panel and electrical conduction means of said circuit blocks, and connector with the use of electroconductivity rubber jumped out of said display panel external form planarly, and it was disposed, and it was composed so that of one part and a plane of the electrode which supplied an electrical signal and a section were piled up in the above emission of light region that they jumped out, and a part was formed on an above transparent member of an above connector.

[BRIEF DESCRIPTION OF DRAWINGS]

[FIG. 1]

It is a movement plane view of the electronic watch which is one embodiment of the present invention.

[FIG. 2]

It is a movement feature sectional view of the electronic watch which is one embodiment of the present invention.

[FIG. 3]

It is a movement plane view of a conventional electronic watch.

[FIG. 4]

It is a movement sectional view of a conventional electronic watch.

[DENOTATION OF REFERENCE NUMERALS]

Five six three the first three the second four three one three three LCD panel illumination board a boards materials b emission of light department c transparent electrode d transparent electrode zebras form connector circuit board panel frames

[DETAILED DESCRIPTION OF THE INVENTION]

[0001]

[INDUSTRIAL APPLICATION FIELD]

The present invention relates to illumination structure of an electronic clock.

[0002]

[PRIOR ART]

Prior art is explained below by means of FIG. 3, FIG. 4.

[0003]

Similarly feature plane view of a movement for digital electronic watches, FIG. 4 are feature sectional views. Battery 29 is a circuit presser bar, and, as for 21, as for upper glass, lower glass, liquid crystal, liquid crystal panel composed of polarisers, 22, as for reflector plate, 23, as for lamp implemented on circuit board 25, 24, as for connector, 26, as for panel frame, 27, circuit case, 28 work as each common knowledge. Lamp 23 for illumination is disposed than liquid crystal panel 21 in the lower part

by a state shown in FIG. 4, structure, besides, to light up indication area from liquid crystal panel 21, reflector plate 22, a gap such as panel frame 26 was common.

[0004]

[PROBLEM TO BE SOLVED BY THE INVENTION]

However, a weak point to describe below was provided by the above-mentioned prior art.

[0005]

It was difficult that enough brightness was secured for structure of a layout as against whole a display panel, and, as for the far-off indication area, reading and *ri* were considerably particularly difficult from a lamp as much as a panel area grew big unless they looked hard. There are many cases that many functionalization uses progress, a display panel of the audacious behavior product of a watch recently, and there can be the thing that a previously described problem controls value as an article. Progress, importance of an illumination function of a portable device compare with before, and 24 hours become markedly high in activity time in a city, and it is clear that this tendency advances in future.

[0006]

Thus, An arbitrary plane layout is selectable, and an object of the present invention is going to provide illumination structure of the electronic clock which the indication area whole area of a display panel is extended over, and can find equality and enough brightness as against a display panel.

[0007]

[MEANS TO SOLVE THE PROBLEM]

It is characterized by that illumination structure of an electronic clock of the present invention repeats the transparent member which formed an electrode supplying an electrical signal in the emission of light region with the use of an electroluminescence element and the emission of light region in an electronic clock comprising circuit blocks to supply an electrical signal to a LCD panel, the display panel in the top surface of the liquid crystal panel, and it disposed.

[0008]

Even more particularly, It is the LCD panel and electrical conduction means of the circuit blocks, and connector with the use of electroconductivity rubber jumps out of the display panel external form planarly, and it is disposed and is characterized by of one part and a plane of a transparent electrode supplying an electrical signal in the emission of light region that it jumps out, and a part is formed on the transparent member of the connector and the thing that were composed to be piled up sectionally.

[0009]

[EXAMPLE]

An example of the present invention is explained below by means of FIG. 1, FIG. 2. Plane view of a movement for digital electronic watches of the present embodiment, FIG. 2 are feature sectional views FIG. 1 in the same way. Panel frame, 7 are circuit presser bars, and, as for 1, as for one lower glass b, liquid crystal, LCD panel to become from one polariser d, 2, as for reflector plate, 4, as for zebra type connector (it is written down with connector as follows), 5, circuit board, 6 work as each common knowledge one upper glass a. In addition, It is common, and it is omitted in FIG. 2 with structure besides structure about illumination conventionally. 3 is the illumination board which made three emission of light department b for three board materials a comprising transparent glass. Three emission of light department b is the structures that bind did electroluminescence (it is written down with EL as follows) light emitting layer with a transparent electrode basically, and bind does the transparent electrode and EL light emitting layer with a dampproofing membrane comprising hateful synthetic resins through water more to improve resistance against humidity. At first the first dampproofing membrane is formed in an aspect of liquid crystal panel 1 side of three board materials a, thereupon, the first three transparent electrode c is formed, thereupon, EL light emitting layer is formed, thereupon, the second three transparent electrode d is formed, the second dampproofing membrane is formed last. In addition, A dampproofing membrane is omitted in the whole figure. A transparent electrode puts around a state shown in FIG. 1 to outer perimeter of three board materials a, and is formed, connector 4 is gone through and is turned on with circuit board 5 electrically. Connector 4 gives *hami* from an external form of liquid crystal panel 1 in a state shown in FIG. 1 planarly, and it is disposed, and four contact portion b with liquid crystal panel 1 and four contact portion a with illumination board 3 are comprised in a state shown in FIG. 2 sectionally. Sectional positioning of illumination board 3 receives lower surface of illumination board 3 in six illumination board taking in department c of panel frame 6, it is done by controlling the top surface of illumination board 3 by six illumination board weight *tsuba* region b of panel frame 6. By six illumination board weight *tsuba* part b is near for illumination board 3 and contact portion with connector 4 as much as possible, and installing, of neither, being turned on is assured. In addition, LCD panel 1 is disposed by lower surface of illumination board 3, and it is fixed section positioning in six panel weight *tsuba* part a of panel frame 6.

[0010]

It is a giving up range that showed in FIG. 1 in two points of broken chain line, and it is a part the outside is given up from this line, and to lose its eyesight of in a product by boards. The emission of light department can be brought to a state shown in FIG. 1 according to the present invention to the position where a giving up range is last, it depends, and bright indication is enabled. In addition, Because it is the inside, and the emission of light department can be posted freely from a giving up line, if the EL emission of light region does with indication area having a letter, character string, a sign, some meanings such as a mark, and it

is repeated in panel indication area, and it disposes, it can be done with a more value-added high product.

[0011]

Illumination board 3 in the present embodiment used simple glass board member to comprise big external form shape *NONIF than liquid crystal panel 1, but, even if the number of the establishment of the emission of light region is reduced when it supposes with member with the use of *dokoita*, light can be led to indication area effectively.

[0012]

In addition, In the exemplary embodiment, the point that was turned on with circuit board 5 through connector 4 of illumination board 3 was one place, but, multiple pieces may be established if necessary.

[0013]

In addition, In the exemplary embodiment, illumination board 3 was used, but, it goes without saying that it makes the emission of light part is installed in a cover glass directly, and serve as a role of an illumination board, and a similar effect is provided

[0014]

?

[EFFECT OF THE INVENTION]

An effect of less than or equal to competing is provided for illumination structure with the use of a conventional lamp according to the present invention as had described as things mentioned above.

[0015]

One emission of light department can be established for a plane, a section in indication area of a LCD panel soon as much as possible. The planar degree of freedom of two emission of light department establishment position is extremely high, and an establishment point is multiple pieces establishment ability as necessary, too.

[0016]

It is lighter in indication area by 31, 2, and, besides, the indication area whole area is lasted for, and uniform brightness can be provided.

[0017]

There is not thing need to change clock structure of four before greatly, and it can be realized by simple structure. A cost merit is big at the point where it doubles, and electrical conduction with a circuit board can take connector for display panels in particular as.

[0018]

In this way, according to illumination structure of an electronic clock of the present invention, a high article of the utility that indication subject matter of a clock is read easily in the dark, and it can be taken as gets possible to be provided in a market. The role that the present invention serves as in society which 24 hours of activity time go ahead through more and more in the future is big, and the effect is great.

